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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/579,576	05/25/2000	Ho-Jin Kweon	003364.P048	7384

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EXAMINER	
WILLS, MONIQUE M	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/579,576	KWEON ET AL.	
	Examiner	Art Unit	
	Monique M Wills	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/20/04*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *23-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22 and 29-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 May 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed February 20, 2004. The rejection of claim 18 under 35 U.S.C. 112, second paragraph is overcome. The rejection of claims 1,5,20,21,33 & 34 under 35 U.S.C. 102(b) as being anticipated by Saidi et al., U.S. Patent 5,851,696, is overcome. The rejection of claims 22 & 25 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al. U.S. Patent 5,851,696 as applied to claims 1 & 5, and further in view of Matsubara U.S. Pub. 2001/0010807, is overcome. The rejection of claims 1,5,8,9,16,17,29 & 30 under 35 U.S.C. 103(a) as being unpatentable over Omaru et al., U.S. Patent 6,146,790 in view of Gan et al., U.S. Patent 6,153,338, is overcome. The rejection of claims 1 & 3 under 35 U.S.C. 103 (a) as being unpatentable over Miyasaka U.S. Patent 5,869,208 in view of Gan et al., U.S. Patent 6,153,338, is overcome. The rejection of claims 1-4 & 35 under 35 U.S.C. 103(a) as being unpatentable over Ikawa et. al., U.S. Patent 5,922,491 in view of Gan et al., U.S. Patent 6,153,338, is overcome. The rejection of claims 5-7 under 35 U.S.C. 103(a) as being unpatentable over Ikawa et. al., U.S. Patent 5,922,491 in view of Gan et al., U.S. Patent 6,153,338, is overcome. The rejection of claims 1-3, 5-7, 16-19 & 29-32 under 35 U.S.C. 103(a) as being unpatentable over Gosh et al. U.S. Patent 6,589,694 in view of Gan et al., U.S. Patent 6,153,338, is

reapplied in view of applicant's remarks. The new ground rejections are as follows:

- Claims 1-7, 16,17,20,21,29,30,33 & 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyasaka U.S. Patent 5,869,208.
- Claims 1-7,16,17,20,21,29,30,33 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338.
- Claims 22 & 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338 and further in view of Matsubara U.S. Pub. 2001/0010807.
- Claims 1-9,16 -19 & 29-32 are rejected under 35 U.S.C. 103(a) being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and futher in view of Gan et al. U.S. Patent 6,153,338

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 16,17,20,21,29,30,33 & 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyasaka U.S. Patent 5,869,208.

With respect to claims 1 & 5, Miyasaka teaches a physical mixture of a lithiated transition metal compound (col. 11, lines 10-20), a powder metal including nickel or aluminum (col. 8, lines 10-15), a carbon black conductive agent (col. 8, lines 5-10), a binder (col. 8, lines 30-45) and an organic electrolyte solution (col. 8, lines 48-53). With respect to claim 2, an aluminum semi-metal is added to the active material (col. 8, lines 10-15). With respect to claims 3 & 7, the active material includes $LiCoO_2$, embracing formula 7, when B is Co and A is O (col. 5, lines 15-25). With respect to claims 4 & 6, the metal additive is 2 to 15 wt % of the active material (col. 8, lines 15-20). With respect to claims 16,17, 29 & 30, the active material includes $LiCoO_2$ embracing $LiBA_2$ and $LiBO_{2-z}A_z$ when B is Co and A is O (col. 8, lines 15-25). With respect to claims 20, 21, 33 & 34, the active material is $LiCoNiO_2$, embracing $LiNiCoA_2$ and $LiNiCoO_{2-z}A_z$ when A is oxygen (col. 8, lines 15-25).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7,16,17,20,21,29,30,33 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338.

Saidi teaches a rechargeable lithium battery (abstract). With respect to claims 1 & 5, Saidi teaches a slurry composition comprising: a physical mixture of a positive active material including $LiMnO_4$, $LiCoO_2$, $LiNiO_2$, $LiNiVO_4$, $LiCoVO_4$, $LiCoNiO_2$ or $LiTmO_2$ where Tm is a transition metal or combination of transition metals (col. 6, lines 10-20); a binder (col. 9, lines 10-15); a carbon conductive agent (col. 9, lines 15-20); and an organic solvent (col. 9, lines 65-68); coated onto a current collector and dried (col. 9, lines 15-21 & 60-68). With respect to claims 3 & 7, the positive active material includes $LiCoO_2$ (instant formula 3), $LiNiO_2$ (instant formula 3) or $LiCoNiO_2$ (instant formula 11). See column 6, lines 10-20. With respect to claims 16 & 29, the active material is $LiCoO_2$ embracing the formula Li_xBA_2 when x=1 and A is oxygen (col. 6, lines 10-20). With respect to claims 17 & 30, the active material is $LiCoO_2$ embraces the formula $Li_xBO_{2-z}A_z$

when x=1 and A is oxygen (col. 6, lines 10-20). With respect to claims 20 & 33, the active material is $LiCoNiO_2$, embraces the formula Li_xNiCoA_2 when x=1 and A is oxygen (col. 6, lines 10-20). With respect to claims 21 & 34, the active material is $LiCoNiO_2$, embraces the formula $Li_xNiCoO_{2-z}A_z$ when x=1 and A is oxygen (col. 6, lines 10-20).

Saidi is silent to adding a metal or semi-metal conductive agent (claims 1, 2 & 5), in an amount of 0.01 to 10wt% (claims 4 & 6).

Gan teaches that it is conventional to employ nickel and aluminum conductive agents in lithium nickel/cobalt oxide positive electrodes (claims1,2 & 5). With respect to claims 4 & 6, the conductive agent may be added in an amount of 6% by weight (col. 9, lines 5-15).

Saidi and Gan are analogous art because they are from the same field of endeavor, namely, fabricating rechargeable lithium cells.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ nickel or aluminum of Gan in the positive electrode of Saidi, in order to increase conductivity of the positive electrode.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22 & 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Gan et al., U.S. Patent 6,153,338 and further in view of Matsubara U.S. Pub. 2001/0010807.

Saidi in view of Gan teach a positive active slurry composition as described hereinabove. Saidi teaches a positive active material comprising $LiTmO_2$, where Tm is a combination of transition metals (col. 6, lines 15-20).

Saidi does not expressly disclose a lithium nickel/cobalt material of the formula $Li_xNi_{1-y-z}Co_yM"A_2$.

However, Matsubara teaches that it is conventional to employ lithium nickel/cobalt oxides of the formula $Li_yNi_{1-x}Co_{x1}M_{x2}O_2$ were M is Al, Fe, Mn where y is $0.9 < y < 1.3$ and $0 < x < 0.5$ (¶ 13-14). This compound improves the charging and discharging cycle characteristics of the positive electrode so that it retains high battery capacity (abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the instant invention was made, because

even though Saidi does not specifically teach $Li_xNi_{1-y-z}Co_yM"A_2$, Matsubara teaches that material of this formula improves the charging and discharging cycle characteristics and battery capacity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9,16 -19 & 29-32 are rejected under 35 U.S.C. 103(a) being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and futher in view of Gan et al. U.S. Patent 6,153,338.

Gosho teaches a positive active material comprising $LiCoO_2$, $LiNiO_2$,$LiCo_{1-x}Ni_xO_2$, wherein $0.1<X$ and $Y < 0.1$ (col. 6, lines 15-23). With respect to claims 1 & 5, The active material is prepared by mixing a binder, carbon black and N-methyl-z-pyrrolidone to form a slurry (col. 19, lines 45-55), the slurry is applied onto both surfaces of a current collector and dried (col. 19, lines 45-55). With respect to claims 3 & 7, the positive active material includes $LiCoO_2$ (instant formula 3), $LiNiO_2$ (instant formula 3) or $LiCoNiO_2$ (instant formula 11). See column 6, lines 15-23. With respect to claims 8 & 9, the organic solvent is N-

methylpyrrolidone (col. 19, lines 50-55). With respect to claims 16 & 29, the active material is $LiCoO_2$ embracing the formula Li_xBA_2 when x=1 and A is oxygen (col. 6, lines 15-23). With respect to claims 17 & 30, the active material is $LiCoO_2$ embracing the formula $Li_xBO_{2-z}A_z$ when x=1 and A is oxygen (col. 6, lines 15-23). With respect to claims 18, 19, 31 & 32, the active material is $LiNi_{1-x}Al_xO_2$, embracing the formula $Li_xB_{1-y}M"_yA_z$ when B is Ni, M" is Al and A is O (col. 6, lines 15-23).

Gosho is silent to adding a metal or semi-metal conductive agent (claims 1, 2 & 5), in an amount of 0.01 to 10 wt% (claims 4 & 6).

Gan teaches that it is conventional to employ nickel and aluminum conductive agents in lithium nickel/cobalt oxide positive electrodes (claims 1& 5). With respect to claims 4 & 6, the conductive agent may be added in an amount of 6% by weight (col. 9, lines 5-15).

Gosho and Gan are analogous art because they are from the same field of endeavor, namely, fabrication rechargeable lithium cells.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ nickel or aluminum of Gan in the positive electrode of Gosho in order to increase conductivity of the positive electrode.

Response to Arguments

Applicant asserts that Saidi et al. (U.S. Patent 5,851,696) does not anticipate the instant invention because it fails to teach or suggest a metallic or semi-metallic additive. The assertion is correct and the rejection claims 1,5,20,21,33 & 34 under 35 U.S.C. 102(b) as being anticipated by Saidi et al. U.S. Patent 5,851,696, is overcome.

Saidi does not teach a metallic or semi-metallic additive, and Matsubara (U.S. Pub. 2002/0010807) alone does not cure the deficiencies of Saidi. Therefore, the rejection of claims 22 & 25 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al. U.S. Patent 5,851,696 as applied to claims 1 & 5, as further in view of Matsubara U.S. Pub. 2001/000110807, is overcome.

Applicant contends that Omaru (U.S. Patent 6,146,790) does not teach a physical mixture of an active material, binder, carbon conductive agent and organic solvent. Gan et al., U.S. Patent 6,153,338 does not cure the deficiencies of Omaru, and therefore, the rejection of claims 1,5,8,9,16,17,29 & 30 under 35 U.S.C. 103(a) as being unpatentable over Omaru et al., U.s. Patent 6,146,790 in view of Gan et al., U.S. Patent 6,153,338, is overcome.

Applicant's arguments, with respect to the combination of Miyasak U.S. Patent 5,869,208 in view of Gan U.S. Patent 6,153,338 have been fully considered and are persuasive. The rejection of claims 1 & 3 under 35 U.S.C. 103 (a) as being unpatentable over Miyasaka U.S. Patent 5,869,208 is overcome.

Applicant failed to address the rejection of claims 1-4 & 35 under 35 U.S.C. 103(a) as being unpatentable over Ikawa et. al., U.S. Patent 5,922,491 in view of Gan et al., U.S. Patent 6,153,338. However, the rejection is withdrawn, because the Ikawa teaches reacting a metallic additive with a lithiated compound to form an electrode, instead of physically mixing said materials. Therefore, the rejection is withdrawn.

Applicant failed to address the rejection of claims 5-7 under 35 U.S.C. 103(a) as being unpatentable over Ikawa et. al., U.S. Patent 5,922,491 in view of Gan et al., U.S. Patent 6,153,338. However, the rejection is withdrawn, because Ikawa teaches reacting a metallic additive with a lithiated compound to form an electrode, instead of physically mixing said materials. Therefore, the rejection is withdrawn.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply

is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.Should you have questions on access to the Private PAIR system, contact theElectronic Business Center (EBC) at 866-217-9197 (toll-free).

MW

5/8/04

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